

BODYBOARD STRUCTURE AND THE METHOD FOR MAKING IT

BACKGROUND OF THE INVENTION

1. Field of the Invention

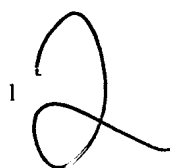
The present invention relates to a bodyboard structure, and more particularly to a bodyboard structure and the method for making it.

2. Description of the Related Art

A conventional surfboard is disclosed in U.S. Patent No. 4,713,032 to Frank. The Frank reference disclosed a surfboard comprising a foam core 8 of EPS or PU, fibrous mates or fibrous fabric 9 wound around the foam core 8, a synthetic resin 10 saturated with the fibrous fabric 9, and a surface layer 6 laminated on the mixture of the fibrous fabric 9 and the synthetic resin 10, thereby forming a finished laminate 12. The mixture of the fibrous fabric 9 and the synthetic resin 10 is stiff and rigid enough, so that the surface layer 6 is not used to protect the foam core 8. However, the surfboard made of the mixture of a reinforced fibrous fabric and a synthetic resin generally has a stiff and rigid structure so that it easily hits and hurts a user when the user falls into the sea during surfing. Therefore, a bodyboard is produced to overcome the drawback of the surfboard.

A conventional bodyboard shown in Figs. 5 and 6 includes a board 20 made of expanded polyethylene, a surface layer 21 made of expanded polyethylene bonded on the top of the board 20, two side layers 22 made of expanded polyethylene bonded on the two sides of the board 20, and a bottom plate 25 bonded on the bottom of the board 20.

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1 In comparison, the bodyboard made of expanded polyethylene(pe) or
2 polypropylene(pp) material usually has a soft and flexible structure, thereby
3 preventing from injuring the user so as to assure the user's safety. Therefore,
4 the bodyboard can be used to overcome the drawback of the surfboard which
5 easily hurts the users. In general, the bodyboard and the surfboard respectively
6 belong to two different fields.

7 The polyethylene for making the board 20 is expandable at a foaming
8 rate of 20 to 30 times so that there are many "air-cells" 23 contained in the
9 board 20 as shown in Fig. 6 and the air-cells 23 will decide the floating feature
10 of the board 20. The polyethylene for making the surface layer 21 and the side
11 layers 22 is at a foaming rate of 8 to 15 times. Therefore, the air-cells 23
12 contained in the surface layer 21 and the side layers 22 are smaller than the
13 air-cells 23 contained in the board 20.

14 Usually, colors or patterns are formed on the surface layer 21 so that
15 the bodyboard presents an aesthetic quality. However, the colors or patterns
16 will quickly fade under the sunshine. In addition, the surface layer 21 cannot
17 be used to protect the board 20 from directly contacting water, dirt or scum,
18 and cannot be used to protect the board 20 made of expanded polyethylene
19 from being corroded by the sea water. Further, the surface layer 21 will be
20 broken under the sunshine or by friction for a period of time. It is known that
21 the ultraviolet rays in the sunshine and seawater will damage the expanded
22 polyethylene. Once the air-cells 23 contained in the surface layer 21 are aged
23 or broken, water will be introduced into the dents formed in the broken
24 air-cells, thereby reducing the floating feature and buoyancy of the bodyboard.

1 Moreover, the surface layer 21 is used to isolate the board 20 from the
2 surroundings. However, the ultraviolet rays of the sunshine will directly
3 project on the surface layer 21 so that the air-cells 23 contained in the surface
4 layer 21 are easily broken, thereby decreasing the aesthetic quality of the
5 bodyboard, and thereby greatly effecting the lifetime of the bodyboard.

6 The surface color of the bodyboard is essentially provided by the
7 color of the surface layer 21 which is made by an extruder that is used to
8 produce surface layers 21 of different colors. However, when the color of the
9 surface layer 21 is changed during the manufacturing process, the extruder has
10 to consume an amount of waste material mixed with different colors.
11 Therefore, the manufacturer of making the surface layer 21 often asks the
12 manufacturer of making the bodyboard to buy a great deal of and a determined
13 amount of surface layers with different colors, thereby greatly increasing the
14 costs of fabrication and the amount of stock.

15 Referring to Figs. 7 and 8, surface layers 211 and 212 are
16 respectively bonded on the top of the board 20 so as to provide different colors
17 or patterns on the top of the board 20. However, an elongated gap or seam 24
18 will be formed between any two adjacent surface layers 211 and 212.
19 Therefore, two black lines are defined between the surface layers 211 and 212
20 on the top of the board 20 because dirt and scum are easily retained in the seam
21 24. Furthermore, the seam 24 easily results in de-lamination of the surface
22 layers 211 and 212.

23 The closest prior art of which the applicant is aware is disclosed in
24 the applicant's U.S. Patent No. 6,106,345.

1 Another closest prior art of which the applicant is aware is disclosed
2 in U.S. Patent No. 4,850,913 to Szabad, which disclosed a sports board. With
3 reference to the Szabad reference, a polyethylene film 6 is heat laminated to a
4 polyethylene foam 8 to form a polyethylene film/foam laminate, wherein the
5 polyethylene film 6 forms the outer skin of the board. The polyethylene
6 film/foam laminate is then respectively adhered to the top surface 10, the lower
7 surface 12 and the edges 14 of the foam core 4 by the heat laminated process,
8 thus encasing the foam core 4 with the laminate, thereby forming the board 2.

9 In the Szabad reference, the board 2 includes a foam core 4, and a
10 laminate laminated on the foam core 4, wherein the laminate includes the
11 polyethylene foam 8 and the polyethylene film 6. In other words, the board 2
12 includes the foam core 4, the polyethylene foam 8 and the polyethylene film 6.
13 However, the laminate has two layers including the polyethylene foam 8 and
14 the polyethylene film 6. Thus, the laminate has a larger thickness due to the
15 two laminated layers, so that the laminate cannot entirely encompass the outer
16 periphery of the foam core 4. Thus, the laminate having a larger thickness has
17 to in turn adhere to the top surface 10, the lower surface 12 and the edges 14 of
18 the foam core 4 respectively, thereby greatly complicating the manufacturing
19 process, and increasing the cost of fabrication. In addition, the laminate is
20 adhered to the top surface 10, the lower surface 12 and the edges 14 of the
21 foam core 4 respectively. Thus, the laminate is not integrally formed with the
22 foam core 4, so that the laminate is easily stripped from the surface of the foam
23 core 4 during a long-term utilization. Further, the laminate includes the
24 polyethylene foam 8 which is located between the foam core 4 and the

1 polyethylene film 6, so that when the laminate is heated, the polyethylene film
2 6 cannot be shrunk to tightly and close encompass the surface of the foam core
3 4, so that the laminate is easily stripped from the surface of the foam core 4
4 during a long-term utilization. Further, the laminate can be heated and adhered
5 to the foam core 4. However, the laminate includes the polyethylene foam 8, so
6 that the laminate cannot be heated and compressed. Thus, the laminate is not
7 integrally formed with the foam core 4, so that the laminate cannot efficiently
8 secure the foam core 4, and is easily stripped from the surface of the foam core
9 4 during a long-term utilization.

SUMMARY OF THE INVENTION

11 In accordance with a first aspect of the present invention, there is
12 provided a bodyboard structure, comprising:

13 a base board having multiple outer surfaces; and

14 a plastic film enclosed around all of the multiple outer surfaces of the
15 base board in a close and seal manner, thereby protecting the entire bodyboard
16 structure.

17 In accordance with a second aspect of the present invention, there is
18 provided a bodyboard structure, comprising:

19 a base board having multiple outer surfaces and a bottom face;

20 a bottom plate mounted on the bottom face of the base board; and

21 a plastic film enclosed around all of the multiple outer surfaces of the
22 base board in a close and seal manner, thereby protecting the entire bodyboard
23 structure.

1 Further benefits and advantages of the present invention will become
2 apparent after a careful reading of the detailed description with appropriate
3 reference to the accompanying drawings.

4 **BRIEF DESCRIPTION OF THE DRAWINGS**

5 Fig. 1A is a perspective view of a base board of a bodyboard
6 structure in accordance with a first embodiment of the present invention;

7 Fig. 1B is a perspective view of the base board after being cut;

8 Fig. 1C is a perspective view of a base board and a plastic film of a
9 bodyboard structure in accordance with a first embodiment of the present
10 invention;

11 Fig. 1D is a perspective view of a bodyboard structure in accordance
12 with a first embodiment of the present invention;

13 Fig. 2 is a side plan cross-sectional view of the bodyboard structure
14 as shown in Fig. 1D;

15 Fig. 3A is a perspective view of a base board of a bodyboard
16 structure in accordance with a second embodiment of the present invention;

17 Fig. 3B is a perspective view of the base board after being cut;

18 Fig. 3C is a perspective view of a base board and a bottom plate of a
19 bodyboard structure in accordance with a second embodiment of the present
20 invention;

21 Fig. 3D is a perspective view of a base board, a bottom plate and a
22 plastic film of a bodyboard structure in accordance with a second embodiment
23 of the present invention;

1 Fig. 3E is a perspective assembly view of the bodyboard structure as
2 shown in Fig. 3D;

3 Fig. 3F is a perspective view of a bodyboard structure in accordance
4 with a second embodiment of the present invention, wherein part of the plastic
5 film is cut;

6 Fig. 3G is a perspective view of a bodyboard structure in accordance
7 with a second embodiment of the present invention;

8 Fig. 4 is a side plan cross-sectional view of the bodyboard structure
9 as shown in Fig. 3G;

10 Fig. 5 is a flow chart of a conventional bodyboard in accordance with
11 the prior art;

12 Fig. 6 is a side plan cross-sectional view of a conventional bodyboard
13 in accordance with the prior art;

14 Fig. 7 is an exploded perspective of another conventional bodyboard
15 in accordance with the prior art; and

16 Fig. 8 is a side plan cross-sectional view of another conventional
17 bodyboard in accordance with the prior art.

18 DETAILED DESCRIPTION OF THE INVENTION

19 Referring to the drawings and initially to Figs. 1 and 2, a method for
20 making a bodyboard structure in accordance with a first embodiment of the
21 present invention comprises the following steps.

22 In the first step, a base board 10 is provided as shown in Fig. 1A. The
23 base board 10 may be made of a foamable material, such as expanded

1 polyethylene (PE), PS, polypropylene (PP) or the like. Then, the base board 10
2 may be cut to have a predetermined shape as shown in Fig. 1B.

3 In the second step, a plastic film 11 may be wrapped on the base
4 board 10 or the base board 10 may be received in the plastic film 11, so that the
5 plastic film 11 directly and entirely encompasses the outer periphery of the
6 base board 10 as shown in Fig. 1C.

7 In the third step, the plastic film 11 and the base board 10 may be
8 heated and sealed, so that the plastic film 11 can shrink inward toward the base
9 board 10, to entirely seal the outer periphery of the base board 10, thereby
10 tightly and closely encompassing the outer periphery of the base board 10, and
11 thereby forming a plastic film protection layer around the outer periphery of
12 the base board 10.

13 In the fourth step, the plastic film 11 and the base board 10 may be
14 heated and compressed, so that the plastic film 11 may be integrally heat
15 bonded on the base board 10 exactly, and so that the outer periphery of the base
16 board 10 may be formed with a serrated surface, thereby forming the
17 bodyboard structure as shown in Fig. 1D, wherein the bodyboard structure
18 includes a base board 10, and a plastic film 11 integrally heat bonded on the
19 outer periphery of the base board 10.

20 In such a manner, the plastic film 11 having a smaller thickness can
21 directly and entirely encompass the outer periphery of the base board 10
22 initially. The plastic film 11 and the base board 10 are then heated, so that the
23 plastic film 11 can entirely seal the outer periphery of the base board 10, and
24 the plastic film 11 can shrink inward, thereby tightly and closely encompassing

1 the outer periphery of the base board 10, and thereby forming a plastic film
2 protection layer around the outer periphery of the base board 10. The plastic
3 film 11 and the base board 10 are then heated and compressed so that the
4 plastic film 11 and the base board 10 are integrally formed with each other, and
5 so that the outer periphery of the base board 10 is formed with a serrated
6 surface.

7 Thus, when the plastic film 11 is heated, the plastic film 11 can
8 shrink inward to tightly and closely combine with the outer periphery of the
9 base board 10, and when the plastic film 11 and the base board 10 are heated
10 and compressed, they are integrally formed with each other to form an integral
11 secure composite plastic film/board structure. Therefore, the plastic film 11
12 and the base board 10 are integrally and securely combined with each other, so
13 that the plastic film 11 cannot be stripped from the base board 10 even during a
14 long-term utilization.

15 In addition, the plastic film 11 entirely encompasses the outer
16 periphery of the base board 10, so that the plastic film 11 together with the base
17 board 10 is initially heated, and is then heated and compressed to form the
18 bodyboard structure, thereby greatly simplifying the manufacturing process,
19 and decreasing the cost of fabrication.

20 Thus, the above-mentioned method may be used for making a
21 bodyboard structure in accordance with a first embodiment of the present
22 invention.

23 As shown in Figs. 1D and 2, the bodyboard structure in accordance
24 with a first embodiment of the present invention includes a base board 10

1 having multiple outer surfaces, and a plastic film 11 enclosed around all of the
2 multiple outer surfaces of the base board 10 in a close and seal manner as
3 shown in Fig. 2, thereby protecting the entire bodyboard structure. Preferably,
4 the plastic film 11 is integrally heat bonded or heat-laminated on all of the
5 multiple outer surfaces of the base board 10 in a close and seal manner.

6 The plastic film 11 is preferably added with ultraviolet inhibitor and
7 anti-oxidant so as to prevent the ultraviolet rays of the sunshine from directly
8 projecting on the base board 10 made of a foamable material, thereby
9 protecting the base board 10. The plastic film 11 has a thickness preferably
10 ranged between 0.01 mm and 0.1 mm so as to protect the base board 10 from
11 directly contacting water, dirt, and scum, and to protect the base board 10 from
12 being directly projected by the ultraviolet of sunshine. The plastic film 11 may
13 have colors, patterns or the like formed thereon.

14 In general, as shown in Fig. 2, the base board 10 is made of a
15 foamable material such as expanded polyethylene (PE) that contains many
16 "air-cells" therein which decide the floating feature of the base board 10. The
17 air-cells will be broken under the sunshine during a long period of time, and
18 may be broken due to continuous friction during long-term utilization. In
19 addition, the ultraviolet rays will damage the air-cells of the expanded
20 polyethylene. Once the air-cells contained in the base board 10 are broken,
21 water will be introduced into the broken air-cells, thereby greatly reducing the
22 floating feature and buoyancy of the base board 10 of the bodyboard structure.

23 The plastic film 11 entirely sealing the outer surfaces of the base
24 board 10 can be used to protect the base board 10 from directly contacting

1 water, dirt or scum, and can be used to protect the base board 10 from being
2 corroded by sea water or being damaged due to continuous friction. The plastic
3 film 11 can also be used to prevent water from infiltrating into the base board
4 10, thereby maintaining the floating feature and buoyancy of the base board 10.
5 In addition, the plastic film 11 containing ultraviolet inhibitor and anti-oxidant
6 can be used to isolate the base board 10 from the ambient surroundings so as to
7 prevent the ultraviolet rays of the sunshine from directly projecting on the
8 outer surfaces of the base board 10, thereby preventing the air-cells of the base
9 board 10 from being broken, and thereby protecting the base board 10.

10 Further, the plastic film 11 has colors or patterns formed thereon.
11 Thus, the manufacturer of making the bodyboard can decide the colors and
12 amounts of the plastic films 11 so that he will not be limited by producers who
13 makes the surface layer of different colors or patterns of the conventional
14 bodyboard, thereby saving cost of production. More important, the plastic film
15 11 is thin, thereby saving the space of stock. In addition, the plastic film 11 is
16 easily obtained so that the bodyboard structure can be easily fabricated without
17 limit of amount.

18 Referring to Figs. 3 and 4, a method for making a bodyboard
19 structure in accordance with a second embodiment of the present invention
20 comprises the following steps.

21 In the first step, a base board 10a is provided as shown in Fig. 3A.
22 The base board 10a may be made of a foamable material, such as expanded
23 polyethylene (PE), PS, polypropylene (PP) or the like. Then, the base board
24 10a may be cut to have a predetermined shape as shown in Fig. 3B.

1 In the second step, a bottom plate 12 having a greater stiffness may
2 be bonded on the bottom face of the base board 10a as shown in Fig. 3C.

3 In the third step, a plastic film 11a may be wrapped on the base board
4 10a and the base plate 12 or the base board 10a and the base plate 12 may be
5 received in the plastic film 11a, so that the plastic film 11a directly and entirely
6 encompasses the outer periphery of the base board 10a and the base plate 12 as
7 shown in Fig. 3D.

8 In the fourth step, the plastic film 11a and the base board 10a may be
9 heated and sealed, so that the plastic film 11a can shrink inward toward the
10 base board 10a, to entirely seal the outer periphery of the base board 10a,
11 thereby tightly and closely encompassing the outer periphery of the base board
12 10a, and thereby forming a plastic film protection layer around the outer
13 periphery of the base board 10a.

14 In the fifth step, the plastic film 11a and the base board 10a may be
15 heated and compressed except the base plate 12, so that the plastic film 11a
16 may be integrally heat bonded on the base board 10a exactly, and so that the
17 outer periphery of the base board 10a may be formed with a serrated surface
18 except the base plate 12 as shown in Fig. 3E.

19 In the sixth step, the plastic film 11b mounted on the base plate 12
20 may be cut out as shown in Fig. 3F, thereby forming the bodyboard structure as
21 shown in Fig. 3G, wherein the bodyboard structure includes a base board 10a,
22 a bottom plate 12 bonded on the bottom face of the base board 10a, and a
23 plastic film 11a integrally heat bonded on the outer periphery of the base board
24 10a except the bottom plate 12.

1 Thus, the above-mentioned method may be used for making a
2 bodyboard structure in accordance with a second embodiment of the present
3 invention.

4 As shown in Figs. 3G and 4, the bodyboard structure in accordance
5 with a second embodiment of the present invention includes a base board 10a
6 having multiple outer surfaces and a bottom face, a bottom plate 12 mounted
7 on the bottom face of the base board 10a, and a plastic film 11a enclosed
8 around all of the multiple outer surfaces of the base board 10a in a close and
9 seal manner as shown in Fig. 4, thereby protecting the entire bodyboard
10 structure. Preferably, the plastic film 11a is integrally heat bonded or
11 heat-laminated on all of the multiple outer surfaces of the base board 10a in a
12 close and seal manner.

13 Although the invention has been explained in relation to its preferred
14 embodiment as mentioned above, it is to be understood that many other
15 possible modifications and variations can be made without departing from the
16 scope of the present invention. It is, therefore, contemplated that the appended
17 claim or claims will cover such modifications and variations that fall within the
18 true scope of the invention.